

# Reaching Practitioners by Mail

*An experiment in dissemination of a dental innovation*

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ALTHOUGH considerable effort has been expended through the years to promote new dental public health programs, little has been published that indicates a comparable effort has been spent on objective evaluations of the promotion methods employed. Each administrator of a new program, therefore, has based his promotional campaign on his own experience.

When a new Public Health Service educational program was launched through a State health agency, an unusually useful opportunity became available to study one widely used means for the dissemination of information—direct mail. In 1960 the State of Minnesota received the first contract from the Service's Division of Dental Health to introduce oral exfoliative cytology into general dental practice as a supplementary technique for the early detection of oral cancer (1).

Having certain advantages over the use of biopsy alone, the cytological examination is a simple, painless diagnostic adjunct to the biopsy. Besides the fact that cell materials can be collected from broader areas and that repeat examinations are less traumatic, cytology is invaluable for use by general practicing dentists, who may be unlikely to perform a biopsy. Watchful waiting and eventual referral for biopsy may be fatal for a patient, because relatively innocuous-appearing lesions may be malignant and may rapidly metastasize. Thus,

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public health programs are stressing the utility of this innovation as a preventive diagnostic tool, not to supplant biopsy but as an adjunct to biopsy.

After 4 years of promotion by the State of Minnesota, oral cytology was still not incorporated into the majority of dental practices. It was suggested that an evaluation be made of direct mail, one of the major promotional methods employed in that State as in other States. A campaign was designed to measure the impact of written communication materials upon a sample of dental "leaders" and their colleagues in the major urban area of the State, the Twin Cities of Minneapolis and St. Paul.

The objective of the experiment was twofold: (a) to assess the degree to which written communication is an effective stimulus for the adoption of the cancer smear technique, and (b) to assess the extent to which communication with a community's dental leaders influences adoption of the technique by them and by other practitioners. The expectation was that physical and financial expenditure could be reduced by using whatever channels of influence that already existed in the dental community. It was hypothesized that if dental information-opinion leaders and their followers could be located and if information were directed to the leaders, the information would flow from a "natural leader" down to his "natural followers."

Earlier research into communication among physicians revealed that of all the factors relevant to the speed of adoption of a new drug, a doctor's integration into the network of interpersonal communication was one of the most

important. Physicians who maintained professional contacts and were consulted for information or advice about medicine tried the innovation before their more isolated colleagues (2). Our research sought to find and use a similar influence structure among dentists.

### Study Sample

In June 1963 the Minnesota State Health Department sent a questionnaire to all dentists practicing in Minnesota in order to ascertain communication patterns throughout the dental community. Returns from 1,298 dentists represented about 60 percent of the State's dentist population (3-5). A section of that survey gathered data on opinion leadership. One of the questions asked was "When you wish information or advice about a *new* procedure or technique, etc., on whom are you most likely to call?" From the responses to this question, it was possible to identify opinion or information leaders among the dentists as designated by their fellow practitioners.

For purposes of the experiment, the sample of leaders and those who chose them was limited to practitioners in the Twin Cities area who answered the questionnaire and to those who were pure dyad relationships. In other words, only those followers were selected for the experiment who were not named by another dentist in the study as a leader. If a leader was chosen by several dentists, then one of his followers was randomly selected to complete the pair. One hundred and eleven dentists were named as information leaders in the 1963 study. For the experiment, 156 dentists met the criteria for leader and follower pairs. Only 281 respondents, or 41 percent, of 693 dentists in the Twin Cities area designated a choice; therefore, the sample may not be representative of all dental pairs in the area.

A check of the questionnaires from the men mentioned as leaders indicated that they were active as officers and participants in professional dental groups. Also, the leaders seemed to be slightly more profession oriented than those who chose them. Other information in the 1963 survey showed that as a group the leaders attended more dental meetings, participated in more study clubs, read more journals, and so forth, than did the followers as a group.

### Experimental Mailings

The 156 dentists were allocated to experimental and control groups, each group consisting of 78 leaders and their followers. Every 3 weeks, from October 1964 to April 1965, only the experimental leaders received mailed communications; these were reprints on intra-oral cytology and, on one occasion, samples of wooden and plastic spatulas to be used to take the smear test. (All members of the experimental and control groups, leaders and followers, had previously received a complete cytology kit from the health department.) Altogether there were eight mailings; two from the chief of the dental health section, Minnesota Department of Health; two from the chief of oral cytology programs in the Division of Dental Health, Public Health Service; and four from two pathologists at the University of Minnesota Dental School.

Some sales-promotion techniques were used to make the communications as attractive to the dentist as possible. In addition to the use of personalized cover letters from the persons mentioned above, first-class postage highlighted by Mayo Brothers commemorative stamps was used. The reprint materials were selected for readability and illustrations as well as their scientific appropriateness (table 1).

Hypothetically, we predicted that (a) the literature sent to the leaders would be read and would influence the leaders to take cytological smears, and (b) leaders would transmit information or the actual literature, or both, to their followers, and the followers would be influenced to take smears. Thus, the number of cytological smears received by the pathology laboratories from the experimental leaders and their followers was expected to increase. Since no mailings were sent to the control dyads, we expected no increase in cytological smears from them. (The control dyads had been matched with the experimental pairs on the basis of their previous history of having taken smears.)

### Followup Survey

Three weeks after the final mailing, we sent a questionnaire to all 156 dentists (78 pairs) in the study, primarily to assess the effectiveness of the experimental information campaign in producing cytological smears. To assure maximum response, the questionnaires for available re-

spondents were picked up in person during the following 3 weeks. Replies were received from 144—a 90.5 percent return. The nonrespondents represented dentists who had died or re-

tired (about 6 percent), who had moved away from the area (2.5 percent), or who had refused to answer the questionnaire (less than 1 percent).

**Table 1. Percentage of dentists who recalled receiving direct mail on oral exfoliative cytology<sup>1</sup>**

Mailout	Order of mailing	Experimental pairs		Control pairs	
		Leaders (N=37)	Followers (N=36)	Leaders (N=36)	Followers (N=35)
Silverman, S., Jr.: Early detection of oral cancer. Practical Dental Monograph, July 1959.....	1	40	9	3	6
Sandler, H. C.: Questions dentists ask about oral exfoliative cytology. New York Dent J 29: 111,112, Mar. 3, 1963....	1	29	3	6	3
Smoking and oral cancer. PHS Publication 1103-A, May 1964.....	2	51	19	22	24
Primer for progressive people. [Undated pamphlet.] American Dental Association, Council on Dental Health, Chicago....	2	14	3	0	3
Can you answer these questions? PHS Publication 1201, May 1964.....	2	17	0	3	3
Health News [issue on oral cancer detection]. New York State Health Department, April 1964.....	3	11	19	8	3
Tiecke, R. W., and Medak, H.: Instructions for taking smears for the early detection of oral cancer. [Abridged version.] Fortnightly Rev, Chicago Dent Soc, Aug. 1, 1963.....	4	37	3	6	0
Oral cytology negative reports—an interpretation of class I and class II findings. Fortnightly Rev, Chicago Dent Soc, Feb. 1, 1964.....	4	26	0	3	3
Aids in the taking of oral (Pap) smears. Fortnightly Rev, Chicago Dent Soc, Feb. 1, 1964.....	4	31	0	6	0
Alling, C. C.: A technique for oral exfoliative cytology. Oral Surg 17: 668-676, May 1964.....	5	29	0	0	3
Sandler, H. C.: Oral exfoliative cytology. Veterans Administration Cooperative Study, 1962.....	6	37	0	0	3
Sandler, H. C.: Oral exfoliative cytology. Medical Tribune, Mar. 15, 1963.....	6	26	3	0	0
Tiecke, R. W., and Medak, H.: Instructions for taking smears for the early detection of oral cancer. Fortnightly Rev, Chicago Dent Soc, Aug. 1, 1963.....	7	37	0	0	0
Gardner, A. F.: An investigation of the use of exfoliative cytology in the diagnosis of malignant lesions of the oral cavity. Acta Cytol (Balt), November-December 1964....	7	29	3	0	3
Samples of plastic and wooden spatulas for scraping smears..	8	66	12	11	17
Shapiro, B. L., and Gorlin, R. T.: An analysis of oral cytodiagnosis. Cancer 17, November 1964.....	( <sup>2</sup> )	34	6	3	3
Other.....	( <sup>2</sup> )	11	3	8	0

<sup>1</sup> Nonrespondents excluded.

<sup>2</sup> Not sent by experimenters.

*What the dentists remembered receiving.* From the responses to the followup questionnaire, it was possible to evaluate the recall of the experimental mailings by those who received them and by those who did not (table 1).

The experimental group of dental leaders received all 15 communications. Only 73 percent reported they remembered receiving any of the material. That is, more than a fourth denied receiving a single mailing. Of those who remembered receiving anything, 66 percent recalled the plastic and wooden spatulas for scraping smears. This was the "most remembered" item. Included in the spatula mailing was a request to the dentist to rate each type of spatula; a return-addressed postcard was provided. This yielded not a single response.

From the reprint literature sent to the experimental leaders, 51 percent recalled the Surgeon General's "Smoking and Oral Cancer" report. More than one-third remembered the Silverman monograph and two instructional articles by Tiecke and Medak, as well as the only book sent, Sandler's study, "Oral Exfoliative Cytology." Curiously enough, almost one-third remembered an article which had not been sent by the experimenters. However, the authors of that article, Shapiro and Gorlin, were the two pathologists who had sent the cover letters on four of the mailings. It cannot be assumed that the sample would distinguish between our study's direct mail material and similar or identical materials from other sources. Eleven percent of the experimental leaders recalled still other literature not sent by the experimenters.

The experimental followers did not receive anything from the experimenters; but, according to our hypotheses, they may have received material from the experimental leaders. (Leaders were requested "Please distribute the extra copies to your colleagues" and, in fact, 51 percent of experimental leaders reported that they had passed on or discussed the cytology materials with other dentists.) Only 36 percent of the experimental followers, however, remembered receiving any of the material. Of those who remembered, almost one-fifth recalled the Surgeon General's report and a special issue on oral cancer detection published in *Health News*.

The sample of spatulas was recalled by 12 percent.

Neither the control leaders nor the control followers were sent any of the mailouts. However, the literature might have been passed on to them either by the experimental pairs or by another agency.

One-fourth of the control dental leaders reported receiving any of the stimuli. Thirty-one percent did not answer the recall questions, the highest proportion of "no answers" of the four test groups. Among the control leaders who remembered seeing any of these materials, again the Surgeon General's report was the main item (22 percent); recall of the sample spatulas scored second (11 percent). The control followers' recall was similar to that of the control leaders. Only 26 percent remembered seeing any of the items. The difference was that only 14 percent of the followers, in contrast to 31 percent of the control leaders, neglected to answer these questions. Of those who said they recalled the communications, 24 percent remembered the Surgeon General's report and 17 percent remembered the spatulas.

It appears that whatever recall impact the communications campaign had was focused on the direct recipients—the experimental leaders. Approximately 10 percent more of the experimental followers expressed recall than did either of the control groups; this fact suggests that the literature may have had some effect, though admittedly slight, on the experimental followers. There is also the possibility that the sample may have received the same stimuli from sources other than the experimenters or that the recall responses may be inflated as a result of faulty recall or response falsification, or both. These are unknown factors.

*Items the dentists considered useful.* When all respondents were asked to indicate which items were particularly useful to them, the Surgeon General's report and the Tiecke and Medak instructions were named by a majority. The Surgeon General's report probably was the most salient as a result of the coverage given it by the mass media. Another instructional reprint, "Aids in the Taking of Oral (Pap) Smears," was mentioned particularly by a majority in the control groups. The spatulas were mentioned

by the experimental followers and control leaders. Sandler's article, "Questions Dentists Ask About Oral Exfoliative Cytology," was cited by the experimental leaders, while *Health News* was cited by the experimental followers. The differences among the items mentioned were actually quite small. Only 3 percent of the total sample, on the average, rated any of the items as useful. Since statistical reliability is low, the pattern of responses must be considered with some reservation. There seemed to be a certain amount of general recall, but it was hardly enough to evoke any of the specific response required to evaluate for utility.

When asked whether they had distributed the extra materials to colleagues or discussed any of the mailings with others, half (51 percent) of the experimental leaders claimed that they had actually done so. Eighty-one percent of these dental leaders read and filed some or all of the mailings, while only 3 percent considered the material "not at all" or "only slightly" useful to their understanding of new developments in dentistry. It should be noted that a greater proportion of experimental leaders reported disposing of the material in some way (81 percent) than reported receiving any of the specific mailings (73 percent). This suggests the possibility of faulty recall or response falsification, or both.

Almost 70 percent of the experimental followers did not answer the questions relating to the use they made of the literature; presumably, because they had not received any. Of the few experimental followers who said they did receive materials, only 29 percent distributed or

discussed the literature with other dentists. (Fifty-eight percent of the experimental leaders who answered the questions claimed that they had done so.) Like the experimental leaders, 83 percent of those experimental followers recalling the literature read and filed the material; only 7 percent considered it relatively useless.

Again, almost 70 percent of the control leaders and followers did not answer the questions on use; presumably, because they had not received the literature. Both control groups resembled the experimental follower group, because the few who received the material treated it in a similar fashion; they did read and file it. While they found it relatively useful, they did not distribute or discuss the literature.

*Frequency of taking oral cancer smears.* The major objective of the experiment, however, was not to test the impact of written communications alone but to see whether such a method would increase the number of cytological smears taken (table 2).

Clearly, the number of smears reported as well as those on record at the University of Minnesota Dental School is small. The trend for self-reported data, however, is suggestive. The leaders reported having taken more smears than did the followers. And during the time of the experiment, the experimental leaders reported having taken more cytological smears than did any of the other three groups.

The discrepancy between the number of smears reported by the dentists and the number of smears on record may be explained by a certain amount of under-recording by the den-

**Table 2. Number of dentists using intra-oral exfoliative cytology technique**

Use of cytology before and after experiment	Experimental		Control	
	Leaders (N=37)	Followers (N=36)	Leaders (N=36)	Followers (N=35)
Before experiment (4-year period):				
Self-report of all smears.....	5	3	7	2
Smears recorded at University of Minnesota Dental School.....	2	1	0	0
Biopsies recorded at University of Minnesota Dental School....	13	4	6	6
After experiment (10-month period):				
Self-report of all smears.....	10	3	3	3
Smears recorded at University of Minnesota Dental School....	0	0	0	0
Biopsies recorded at University of Minnesota Dental School....	6	3	4	0

tal school as a result of the termination of the Public Health Service contract. The cost of reading the cytological smears was absorbed by the State health department under its contract with the Public Health Service. During the time the contract was in effect, most of the smears from the Twin Cities were processed at the University of Minnesota Dental School. Once the cost of the cytological smear was transferred to a regular fee-for-service basis, we assumed that the number of smears sent to the university would decrease. They might be sent instead to commercial laboratories whose records were not available for this study.

While the number of recorded cases is extremely small, a similar but tentative pattern exists for biopsies on record at the dental school; both groups of leaders generally took more biopsies than did their followers. (Before the experiment the control leaders took as many biopsies as did their followers.) It appears that more biopsies than smears are being recorded. Since the onset of the cytology experiment, the rate of recorded biopsies has increased and the rate of smears has decreased. (Note that almost as many biopsies were recorded within the study period of 10 months as in the previous 4 years. One must be careful not to draw the incorrect conclusions that the cytology campaign resulted in decreasing the number of cytological smears and inadvertently increasing the number of biopsies. Field interviews suggested that our recorded data were under-enumerated as some smears were not counted when the reports were submitted on forms other than the official study forms. Other smears may have been lost when the dentist sent the cytological sample to private laboratories or, perhaps, evaluated the slide material independently. All that can be stated is that not only has there been no increase in the use of oral cytology, but little use has been made of the technique.)

### Discussion

How effective was written communication in stimulating the dental practitioners' adoption of the cancer smear technique? The direct-mail method was not successful, at least not in the short run. The literature was not read. Very

little of the small barrage penetrated. What- ever did get through was not enough to affect behavior. Although the experimental leaders reported that they took twice as many smears (10) in the 10-month study period as in the previous 4 years (only 5), the recorded data do not corroborate this finding (0 and 2 smears, respectively). One explanation may be that the experimental leaders felt obligated to report having taken more smears because they directly felt the thrust of the mailings, which emphasized their responsibility as dental leaders.

How effective was communicating with dental leaders in order to influence other practitioners? Again, the experiment indicated only limited success. Whatever impact the information campaign had was focused on the direct recipients of the mail communications—the experimental leaders. A small, but hardly significant, effect was shown on the experimental follower group. Because so little of the information penetrated, it is impossible to assess the efficacy of using the informal communications structure within the dental community. Perhaps a different type of direct-mail campaign, or another method of promotion, or a combination of promotions would be more successful in influencing the leader group initially. This would allow a study of wider dissemination through the informal dental network. (There is the possibility that no hierarchical structuring exists within the dental community. A forthcoming paper suggests that the sociometric dental pattern may only reflect geographic proximity choices.)

The major finding was the limited effectiveness of direct mail, as dramatized by the fact that more than 25 percent of the experimental leader group did not remember a single item. The materials were not read nor did they have much effect on immediately increasing the use of the smear technique. Given additional time, perhaps the majority of dentists will begin to incorporate cytology into their regular examinations.

How, then, can dentists be motivated to make use of the cytological technique? According to the dentists who were interviewed at the time the questionnaires were picked up, many refer suspicious cases to an oral surgeon or to a physi-

cian. Those who are opposed to adopting the smear technique relate that the nature of their practice is limited or that they feel incompetent in this area of diagnosis. However, those who have adopted the technique report that it requires neither specialized skills beyond those which the general practitioner learns in dental school nor much office time. Thus, there seemed to be some discrepancy between the perceived and the actual nature of the cytological test.

As suggested in an earlier report from the Minnesota project, the smear technique may represent a message that is more complex than the usual mechanical innovations occurring in dentistry, such as high-speed drills. In the case of oral cytology, the fundamental role of the dentist may be affected when he perceives it as his responsibility to diagnose oral cancer or to become the physician of the mouth. In the case of high-speed drills, which had an incredibly rapid acceptance, there was no reason to expand the traditional role of the dental operator. When faced with cancer-detection responsibility, however, the dentist may question his competency in this area. In its history, dentistry has not dealt with the possibilities of life or death situations.

A national survey has shown that the cytology message has become garbled by physicians also. Despite years of promotion, there are still many medical practitioners who do not use Papanicolaou smears to diagnose cervical or uterine cancer. The reasons these physicians gave for not taking smears show strong similarity to those reasons given by the Minnesota dentists. Physicians who did not recommend "Pap" smears routinely explained most often that they took smears only if symptoms or some other indication suggested a need (6). Like many dentists, these physicians have misunderstood the purpose of the cytological smear when they view

it as a diagnostic tool to be used in the presence of symptoms, rather than as a preventive measure for the early detection of cancer.

Patient demand may be effective in stimulating the dentist to examine the soft tissue. Perhaps a patient "push" would improve results, because it would force the dentist to redefine his role. The study on physicians, for example, revealed that 57 percent of the total sample reported that at least some of their female patients request the Papanicolaou smear.

Despite the fact that intra-oral cytology is an inexpensive and an uncomplicated procedure, the implications of the procedure itself may necessitate different types of promotional approaches. The changed perspective and behavior required of the dentist should be considered in persuading some practitioners, especially those lacking a preventive orientation, to adopt this particular innovation.

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## Program Notes

### **Silver Solder Containing Cadmium**

The hobbyist who uses silver solder containing cadmium metal may be flirting with a serious health hazard and not know it. Recent deaths related to use in industry of silver solder containing cadmium underscore the need for hobbyists to be aware of the danger when using the solder in home workshops. (Cadmium is used in only certain types of silver solder; tin-based solders do not present this hazard.)

Cadmium, when overheated, vaporizes and produces cadmium oxide—a highly dangerous fume which can cause death even when inhaled in small quantities. The fumes are practically odorless, lethal doses can be inhaled without irritation or discomfort, and it takes 4 to 8 hours for serious symptoms to develop.

### **Fewer Mental Hospital Patients**

The population in State mental hospitals in Illinois declined more in 1965 than in any previous year—dropping from 42,802 patients in fiscal 1964 to 40,811 in 1965. The decline, which started in 1955, accelerated in 1963.

### **Post Staffing for Mental Hospitals**

Several State mental hospitals in New York have begun to use post staffing in efforts to assure basic services to all patients at all times.

The initial step is to completely survey the hospital, then organize and classify each ward according to the needs of the patients therein. For example, staff of the New York State Department of Mental Hygiene divided patients of the State hospitals at Brooklyn and Buffalo into eight classifications—acute medical and surgical, chronic medical care, and so forth. The program required the creation of 222 new positions at the two hospitals to help provide new and intensified treatment and to meet

highly specialized needs of patients.

“Ultimately all our mental institutions will operate under this new concept of staffing,” Gov. Nelson A. Rockefeller commented.

### **Michigan Highway Safety Research**

A \$10 million grant from the U.S. automotive industry has enabled the University of Michigan to establish a highway safety research institute which is developing a comprehensive approach to highway safety. University officials described the grant as the largest corporate gift ever received by a university for any purpose.

Staff of the university had presented the proposal for this broad research program to the automotive industry with a request for financial support, Harlan Hatcher, the president of the university, reported.

### **Early Detection of Lung Cancer**

Cigarette smokers residing in Park Ridge, Ill., participated recently in an experimental cancer detection project. Participants were of both sexes, over 30 years of age, and had smoked one or more packages of cigarettes a day for at least 10 years. For three consecutive mornings they deposited sputum in sanitary vials. The vials were later examined for cancer cells. Cancer cells can be detected in sputum before cancer growths show up on X-rays and before the victim has observable symptoms.

The study was financed by a grant from the American Cancer Society.

### **Spotting Pollution From the Air**

The Pennsylvania Department of Health has begun surveillance of streams from the air. The department's division of sanitary engineering recently chartered a plane for spotting pollution violations in the Commonwealth's streams.

Dr. Charles L. Wilbar, State health secretary and chairman of the sanitary water board, pointed out that from a plane the pollution control staff can better see pollution discharges which would be almost invisible from the ground. Speed of the plane makes possible coverage of a significant portion of the State in one day of flying. Inaccessible sources of pollution are readily observable.

Eventually the air patrol may be conducted on a routine weekly pattern, Wilbar stated.

### **Medical Laboratory Aides**

Twenty high school graduates in the District of Columbia have begun a year's training in medical laboratory work under a new program of the D.C. Department of Public Health.

Courses given in the department's D.C. General Hospital combine academic study and actual laboratory work. Trainees receive subsistence salaries during their year of training and upon successful completion of the course will be considered competent laboratory assistants.

A second group will begin a similar program in October 1966. The programs are funded by the Federal Manpower Development Act.

### **Dog Ticks in Pennsylvania**

A 2-year survey of the tick species in Pennsylvania conducted by the State Department of Health and the department of entomology of Pennsylvania State University has shown that the distribution of the American dog tick in the State closely follows the distribution of Rocky Mountain Spotted Fever.

Only 10 tick species were known in the State before the survey, but 19 species have now been collected.

William Wills, entomologist of the department, advises removal of ticks by a slow, steady pull with tweezers or forceps—not bare fingers.

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*Items for this page: Health departments, health agencies, and others are invited to share their program successes with others by contributing items for brief mention on this page. Flag them for "Program Notes" and address as indicated in masthead.*

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